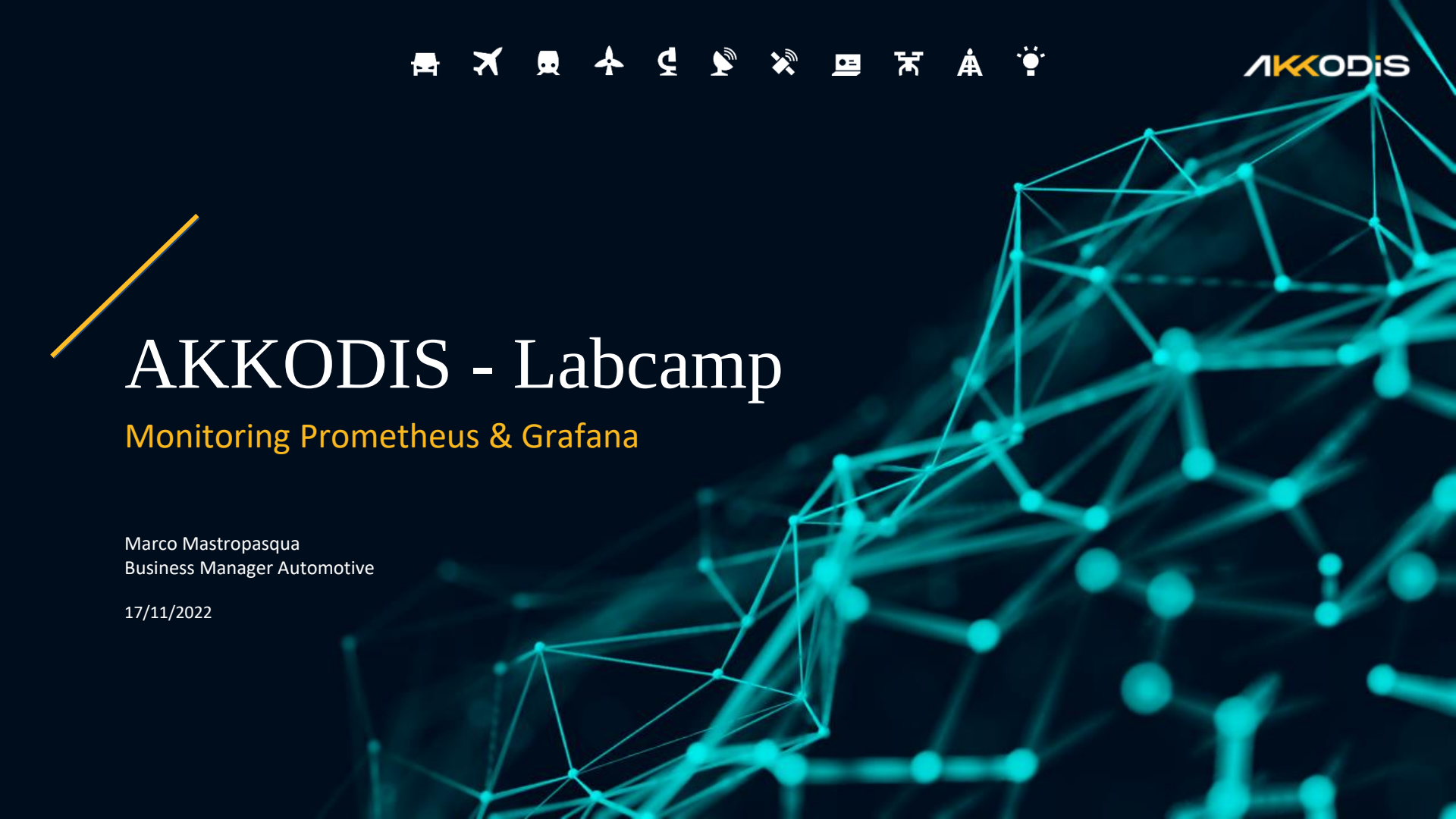


AKKODIS - Labcamp

Monitoring Prometheus & Grafana

Marco Mastropasqua
Business Manager Automotive

17/11/2022

PRESENTATION – **ABOUT ME**

Marco Mastropasqua

SMU Automotive

Technical Business Manager

Agenda

Labcamp 11/11/2022

1. AKKODIS Presentation
2. Theory of monitoring
3. Prometheus
4. Grafana
5. Q&A

Agenda

Labcamp 11/11/2022

Theory of Monitoring

- General overview
- Approaches
- Purposes
- Costs

Prometheus

- Overview
- Setup phase → Ex. 1
- Probe configuration → Ex. 2

Grafana

- Overview
- Setup phase → Ex. 3
- Data sources (Prometheus + Azure) → Ex. 4
- Dashboards & Panels
- Queries → Ex. 5
- Alerts → Ex. 6
- Webhooks or integrations to trigger on alert → Ex. 7
- User configuration → Ex. 8

1

AKKODIS Presentation

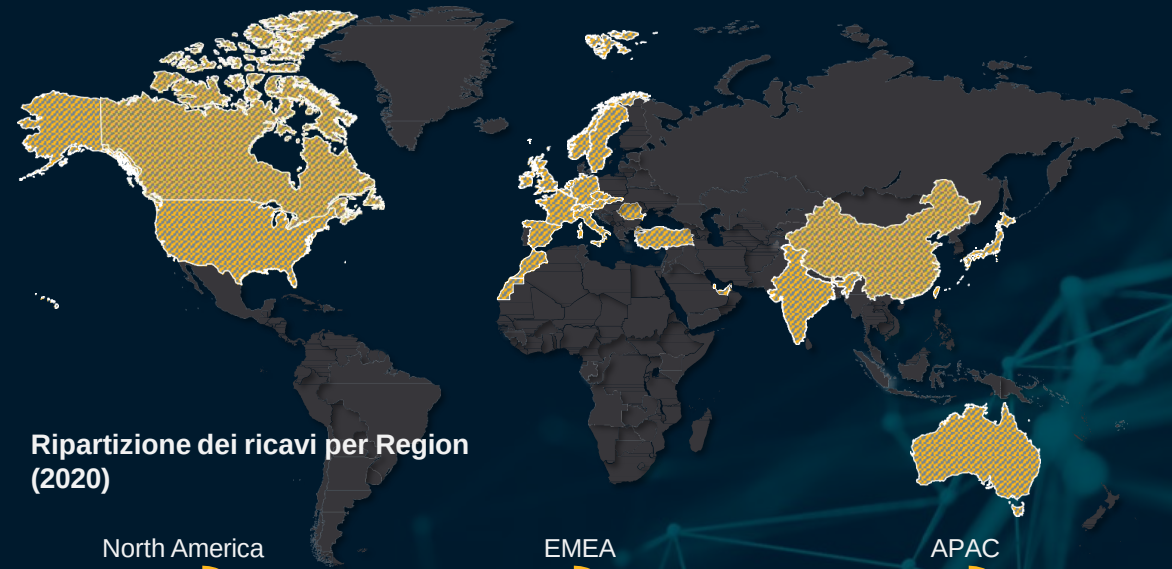

AKKA
modis
soon to become
AKKODiS
Engineering a Smarter Future Together

AKKA & Modis, un vero leader globale dei servizi tecnologici

>50,000
Ingegneri ed Esperti Digitali

>30
Paesi

€3.7B
Ricavi 2020



Ripartizione dei ricavi per Region (2020)

North America ~30%

EMEA ~50%

APAC ~20%

Presenza di AKKA & Modis

#2 **#2 globale** nel mercato dell'R&D ingegneristico, capace di detenere la leadership nel settore della **Smart Industry** con una profonda esperienza intersettoriale

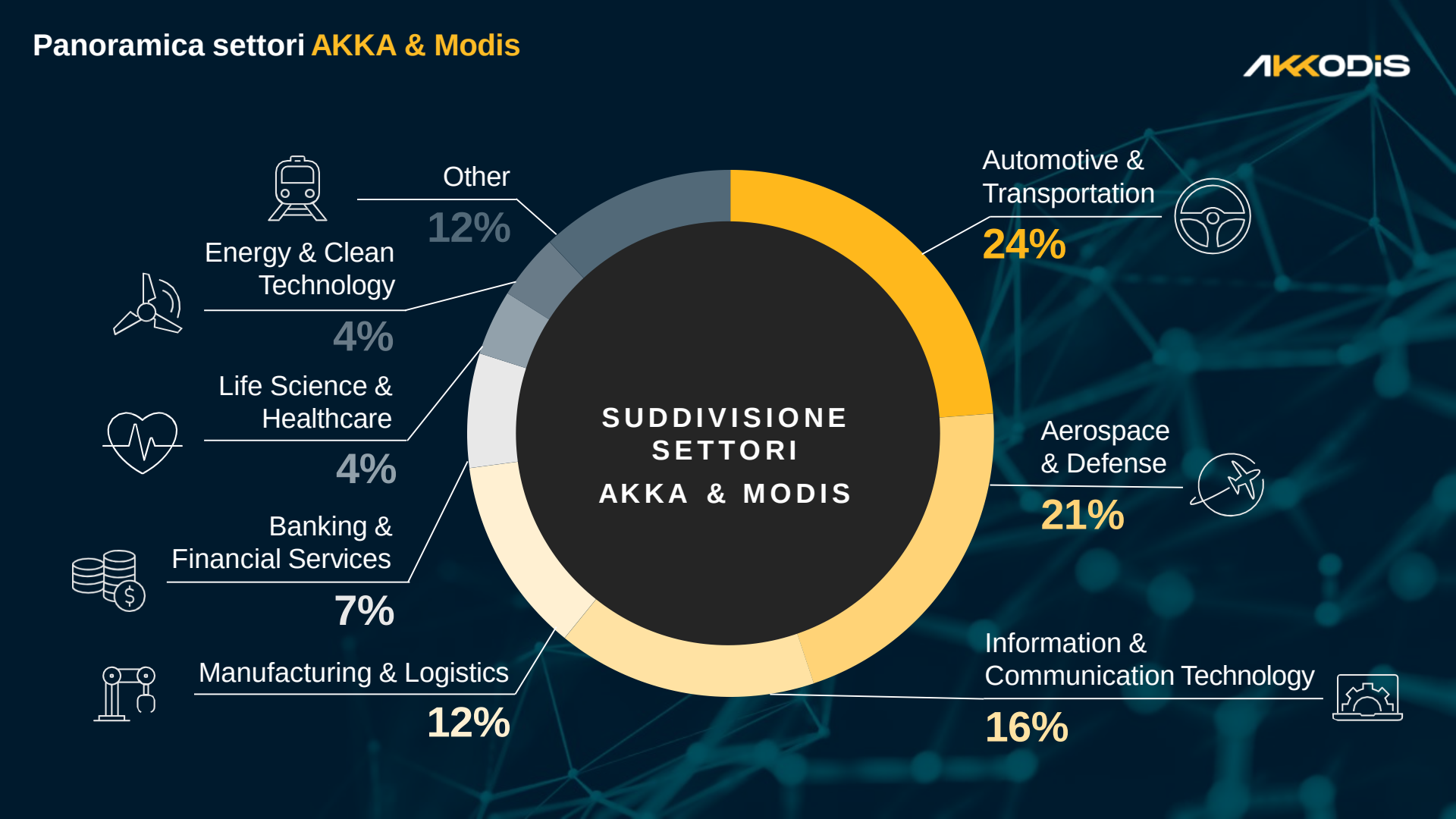
DAIMLER · SNCF · EDF · ALSTOM · CISCO · AIRBUS

> 50,000 ingegneri ed esperti digitali per dare vita al futuro della **Smart Industry**

Maggiore attrattiva per i talenti strategici della Smart Industry in un mercato competitivo

Ci posizioniamo accanto **all'intero ciclo di innovazione** dei nostri futuri clienti, dalla progettazione alla prototipazione in un'ampia gamma di settori

Panoramica settori AKKA & Modis



Geographical **PROXIMITY APPROACH**

14
locations

2

Theory of monitoring

MONITORING – **FOCAL POINT**

- Purposes
- Different approaches
- Monitoring tools
- Advantages & disadvantages
- Effort & costs to implement a monitoring system
- Basic concepts & practice about Prometheus
- Basic concepts & practice about Grafana

MONITORING – **GENERAL OVERVIEW**

- What do you mean with «monitoring»?
- What are the purposes of a monitoring system?
- What are the possible approaches?
- What is the effort to implement a monitoring system?
- What are the running costs?

MONITORING – **DEFINITION**

- What do you mean with «monitoring»?

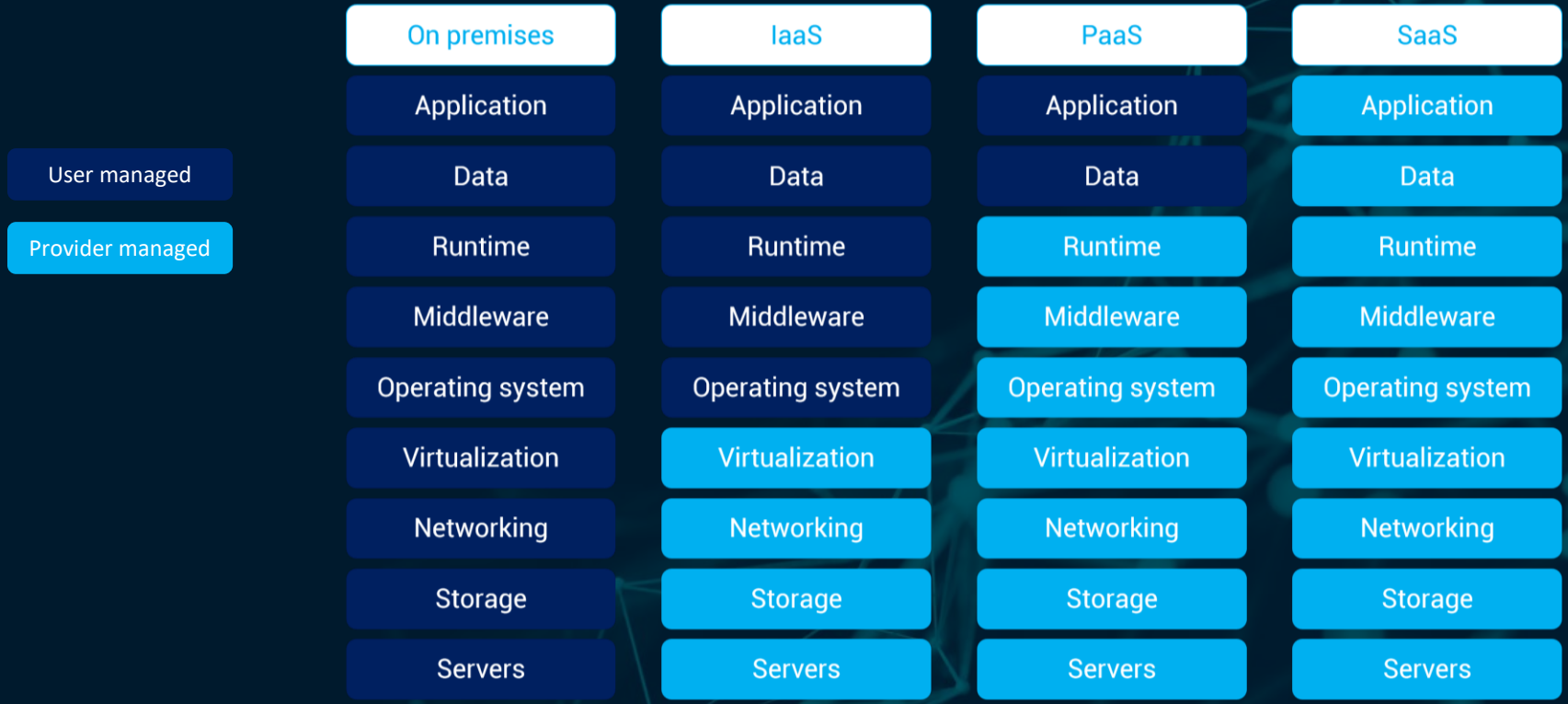
An **IT monitoring** system is a system that include different tools designed to determine current **service status**, detect issues and **help to resolve** them.

IT monitoring tools range from basic checks to more advanced tools that can granularly examine performance, or even automate repairs when problems are suspected.

MONITORING – **APPROACHES**

- What are the important things to monitor in our cloud solution?
  - ❑ Cloud infrastructure resources
  - ❑ Backend applications
  - ❑ Application logs

MONITORING – **APPROACHES**



MONITORING – APPROACHES

Resource to monitor	IaaS	PaaS	SaaS
Infrastructure	**X** Connection to data provided by cloud providers	**X** Cloud provider services	**X** Need to install agents or other type of integrations
Applications	**X** • Health check APIs • Web pages avail. • Messages in queues • …	**X** Not always possible with cloud provider services	**X**
Logs	**X** Integrate with other services	**X** Logs to sent to specific cloud provider services	**X**

MONITORING – APPROACHES EXAMPLES

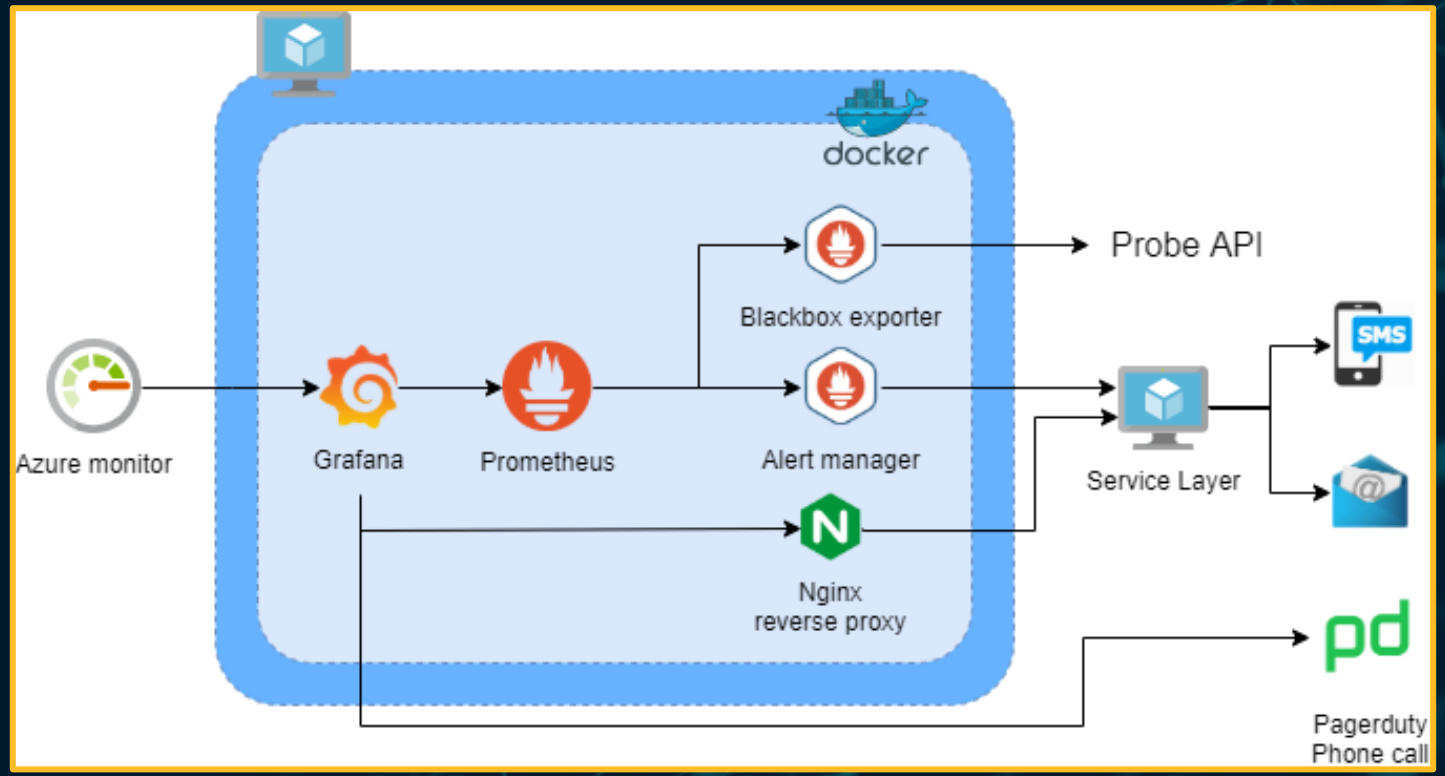
Service	IaaS	PaaS	SaaS
Infrastructure			
Applications			
Logs			

MONITORING – **TOOLS**

Tool	Metrics	Applications	Logs	Use case
AWS Cloudwatch	X	X	X	Cloud AWS
Azure Monitor	X	X	X	Cloud Azure
Site24x7	X	X	X	Cloud
Zabbix	X	X (with script)		Cloud or private network
Nagios	X			Cloud or private network
Prometheus	**X**			**Cloud or private network**
Runscope		X (API)		Test API on cloud
Pagerduty	X	X	X	Generic Cloud
Logentries			X	Log analysis cloud
Graylog			X	Log analysis cloud
ELK	X		X	Cloud or private network
Datadog	X	X	X	Cloud


EXAMPLE

MONITORING – **FOCAL POINT**



MONITORING – ADVANTAGES / DISADVANTAGES

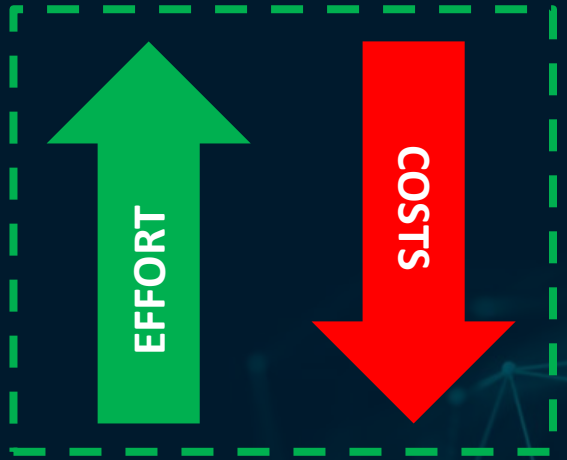
↑ ↓

Type of system	Setup	Maintenance	Flexibility	Costs	Vendor Lock in
IaaS	↓	↓	↑	↑	↑
PaaS	↑	↑	↓	?	↓
SaaS	↑	↑	↓	↓	↓

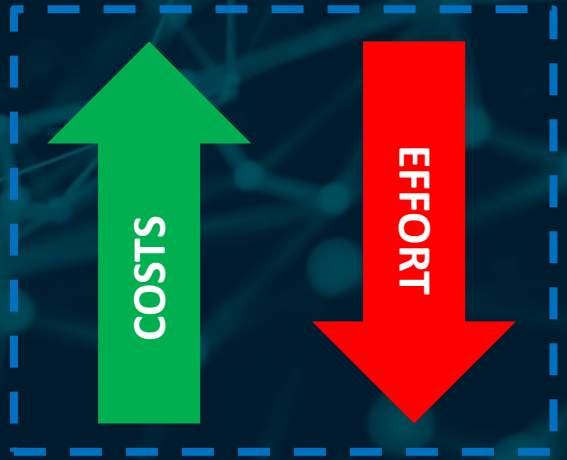
MONITORING – **FOCAL POINT**

What is the relation between effort and costs to implement a monitoring system?

IaaS approach



PaaS / SaaS approach



3 Prometheus

MONITORING – **PROMETHEUS**

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- What is Prometheus?

  https://prometheus.io/docs/introduction/overview/

Prometheus is an **open-source** systems for **monitoring** and **alerting** toolkit originally built at SoundCloud.

- When does it fit?

Prometheus is designed for reliability, to be the system you go to during an outage to allow you to **quickly diagnose problems**.
Each Prometheus **server** is **standalone**.
You can rely on it when other parts of your infrastructure are broken, and you do not need to setup extensive infrastructure to use it.

MONITORING – **PROMETHEUS**

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Features:

- a multi-dimensional data model with time series data identified by **metric** name and **key/value pairs**
- **PromQL**, a flexible **query language** to leverage this dimensionality
- no reliance on distributed storage;
- single **server** nodes are **autonomous**
- **time series** collection happens via a pull model over HTTP
- **pushing time series** is supported via an intermediary gateway
- targets are discovered via **service discovery** or static configuration
- **multiple** modes of **graphing** and dashboarding support

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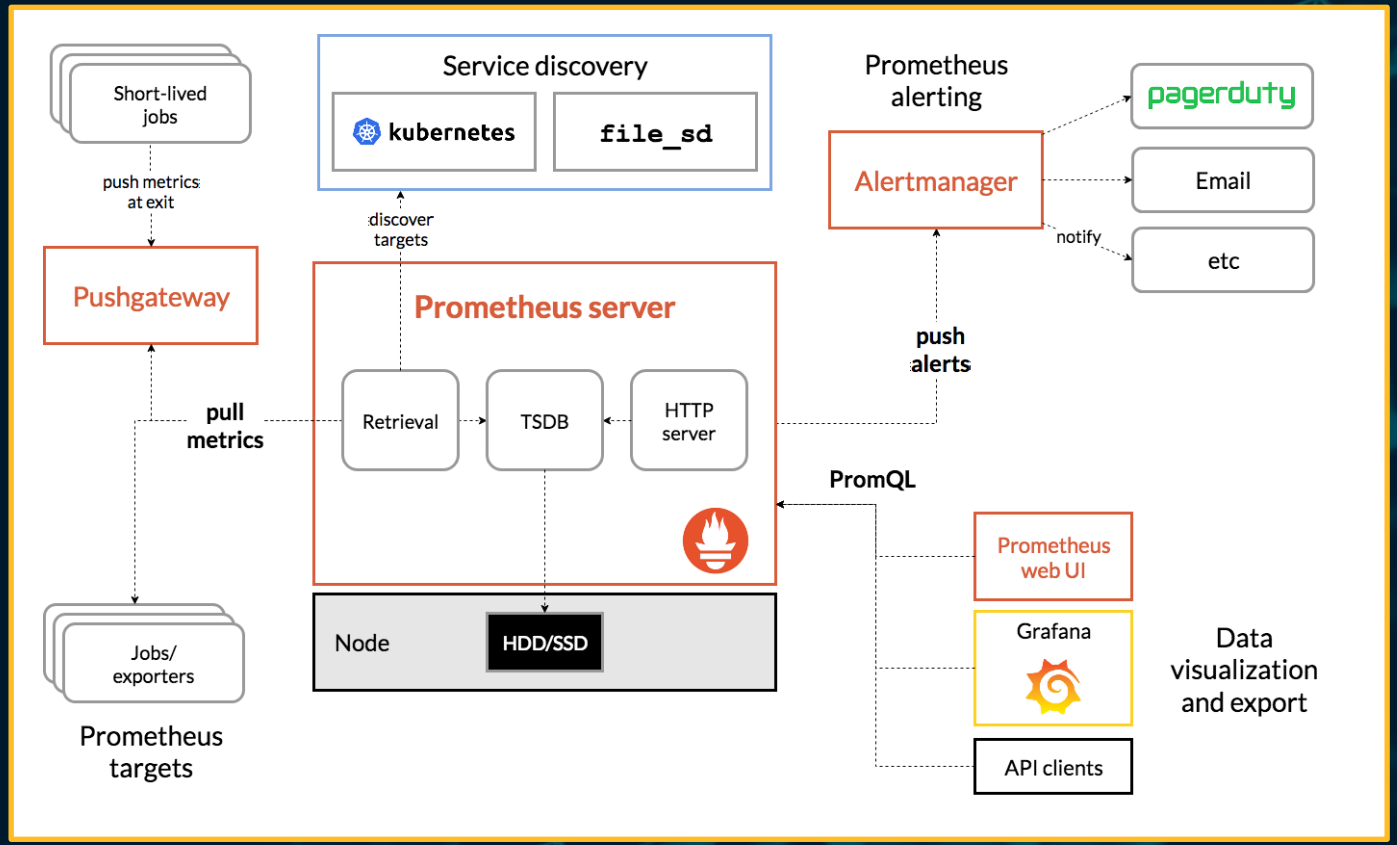
Components:

The Prometheus ecosystem consists of multiple components, many of which are optional:

- the main **Prometheus server** which scrapes and stores time series data
- **client libraries** for instrumenting application code
- a **push gateway** for supporting short-lived jobs
- special-purpose **exporters** for services (like HAProxy, StatsD, Graphite,
- an **alertmanager** to handle alerts

MONITORING – PROMETHEUS



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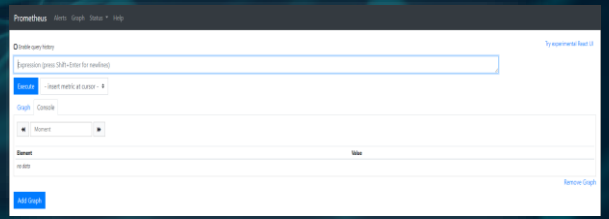
MONITORING – **PROMETHEUS**
Exercise 1

- Setup Blackbox Exporter
  - ❑ Instructions available here

Microsoft Word Document

- Setup Prometheus
  - ❑ Instructions available here

Microsoft Word Document



Config files on Github project here: https://github.com/debug86/labcamp_monitoring

MONITORING – **PROMETHEUS**
Exercise 2

- **Configure API probe**
  - ❑ Check response of an Azure Function:
    https://labcampmonapi.azurewebsites.net/api/labcamp_test_api_probe?code=DoDkKIW4YPCYDNKNYmOb5ZZmXPPccOm9H7SenqUZkzpdZzZbrnzczw==
  - ❑ Instructions available here → Microsoft Word Document

Config files on Github project here: https://github.com/debug86/labcamp_monitoring

4

Grafana

MONITORING – **GRAFANA**

- What is Grafana?

  https://grafana.com/grafana/

Is an **analytics platform** that allow to **query, visualize, alert** on and understand your metrics no matter where they are stored.

Create, explore, and share **dashboards** with your team and foster a data driven culture.

MONITORING – **GRAFANA**

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Features:

- Visualize data in a plethora of visualization options
- Alerts on dashboards
- Unify data from different sources
- Open community
- Extend using thousands of plugin
- Collaborate sharing dashboards across teams

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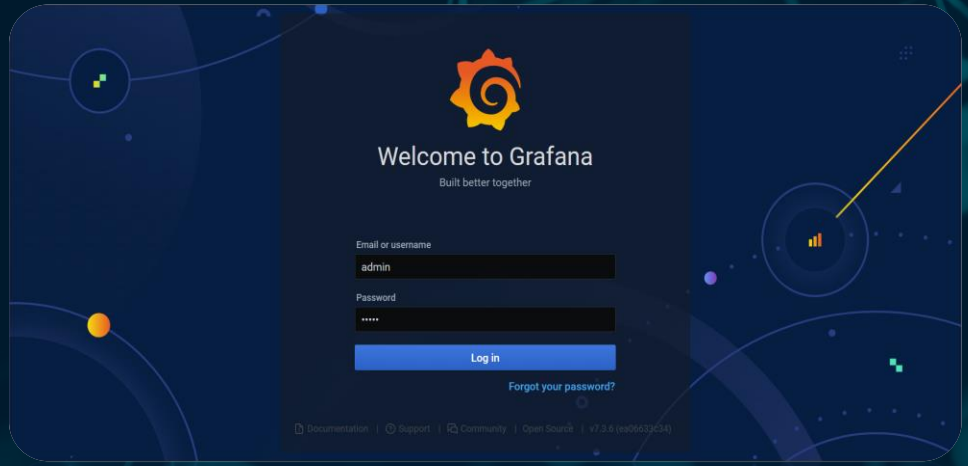
MONITORING – GRAFANA
Exercise 3

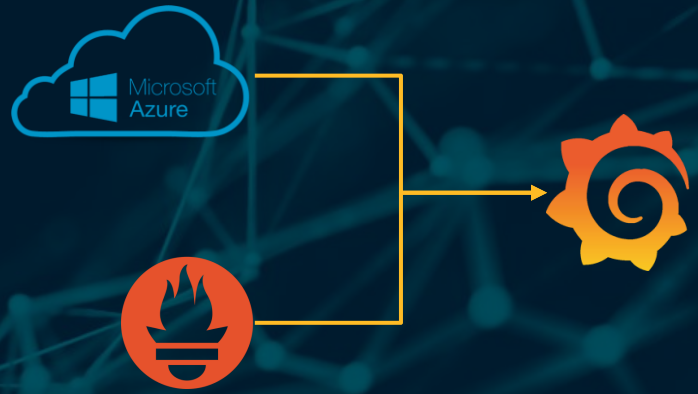
- Setup Grafana
  - ❑ Instructions available here

Microsoft Word Document



MONITORING – GRAFANA
Exercise 4

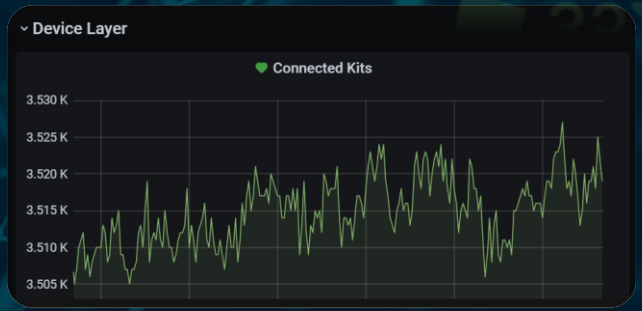
- **Configure datasource in Grafana**
  - ❑ Configure Prometheus datasource
  - ❑ Configure Azure datasource



- Instructions available here

MONITORING – GRAFANA
Exercise 5

- Configure new panels and queries
  - ❑ Create a new dashboard
  - ❑ Configure 2 panels for the Azure Function
  - ❑ Configure panel for an Azure EventHub
- Instructions available here

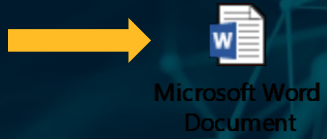


Microsoft Word Document

MONITORING – GRAFANA
Exercise 6

- Configure alert on existing panels
  - ❑ Configure alert on Azure Function for response code != 200
  - ❑ Configure panel on Azure EventHub for number of messages threshold

- Instructions available here



Event Hub tool on Github project here: https://github.com/debug86/labcamp_monitoring

MONITORING – **GRAFANA**
Exercise 7

- **Configure events to trigger for alerts**
  - ❑ External integrations
  - ❑ Webhook → calls to the Function visible on Azure Portal
- Instructions available here → Microsoft Word Document

MONITORING – GRAFANA
Exercise 8

- **Users configuration**
  - ❑ Create teams
  - ❑ Create users and assign to specific teams
  - ❑ Configure permissions for dashboards

- Instructions available here → Microsoft Word Document

5

Q&A

AKKODIS Automotive & Transportation Industry

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